Bitcoin price predication: linear regression

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Content

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History of Payments

- Barter system
- Traditional payment systems
- Cryptocurrency:
  - Bitcoin
  - Ethereum
  - USD Coin
  - Ariva
  - Binance Coin

Objective

Explore significant features → Introduce a predictive model → Find out the accuracy

Methodology

- Explored various features which may have correlation with the price of Bitcoin

- Train-Test split executed using standard Linear Regression methodology rather than as a Time Series, per project requirements

- As such, the price of bitcoin is predicted at a moment in time, rather than predicted on a time series basis

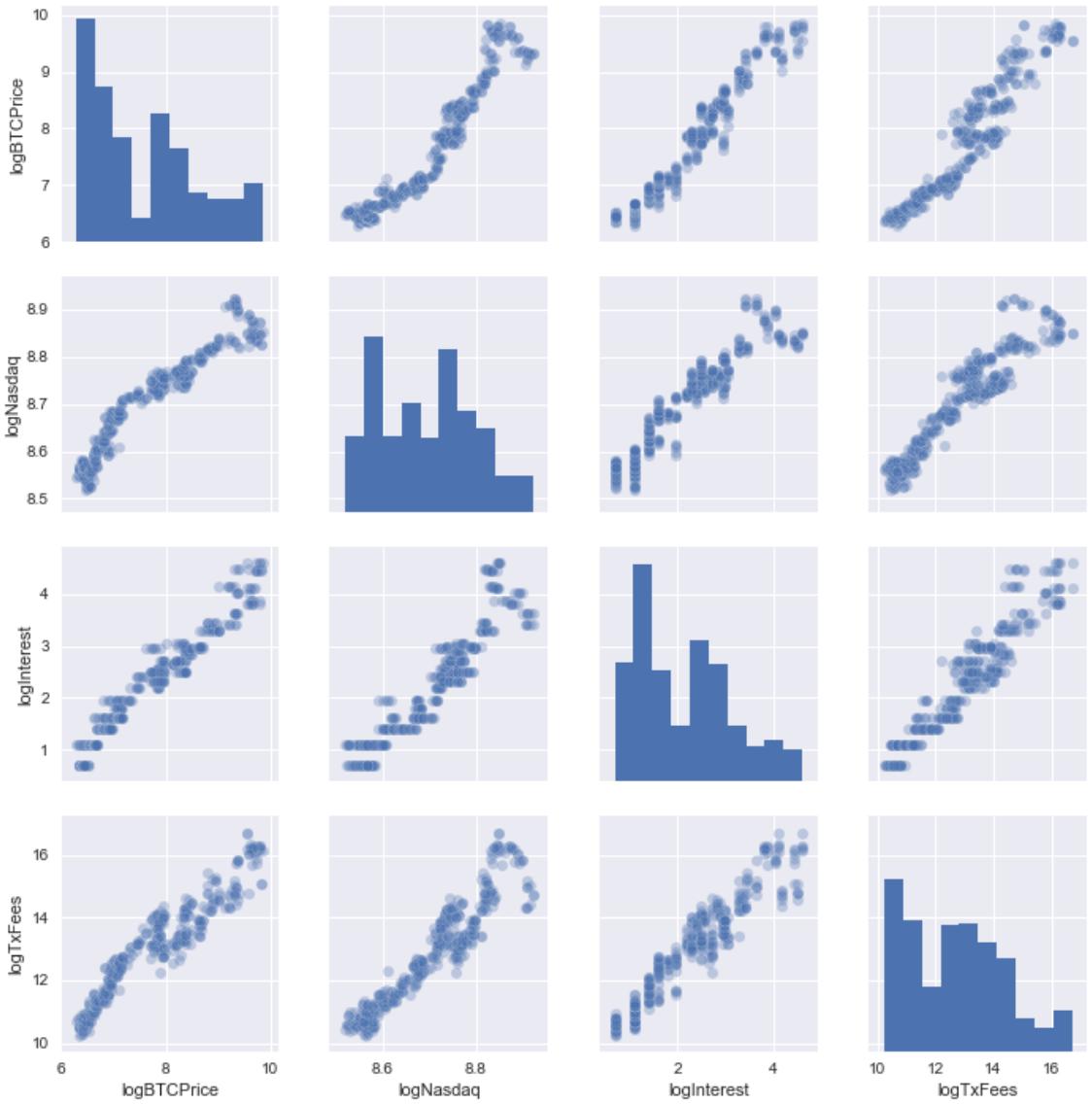
Scraping

- Bitcoin features
  - https://coinmarketcap.com/
- Google search
  - https://trends.google.com/trends/?geo=SA

Dataset (Feature Exploration)

Index	BTCPrice	logBTCPrice	logETHPrice	logBTCVol	logTxFees	logCostperTxn	logNoTxns	logAvgBlkSz	logUniqueAddresses	logHashRate	logNasdaq	logGold	logInterest	Interest	TxFees	Nasdaq
2021-06-01 00:00:00	7383	8.907	5.561	14.1	14.32	3.751	12.8	0.2322	13.42	17.73	8.964	5.066	3.829	46	1.651e+06	7816
2021-06-08 00:00:00	7383	8.907	5.561	14.1	14.32	3.751	12.8	0.2322	13.42	17.73	8.964	5.066	3.829	46	1.651e+06	7816
2021-06-15 00:00:00	7383	8.907	5.561	14.1	14.32	3.751	12.8	0.2322	13.42	17.73	8.964	5.066	3.829	46	1.651e+06	7816
2021-06-22 00:00:00	7383	8.907	5.561	14.1	14.32	3.751	12.8	0.2322	13.42	17.73	8.964	5.066	3.829	46	1.651e+06	7816
2021-06-29 00:00:00	7383	8.907	5.561	14.1	14.32	3.751	12.8	0.2322	13.42	17.73	8.964	5.066	3.829	46	1.651e+06	7816
2021-07-01 00:00:00	7383	8.907	5.561	14.1	14.32	3.751	12.8	0.2322	13.42	17.73	8.964	5.066	3.466	32	1.651e+06	7816
2021-07-06 00:00:00	7383	8.907	5.561	14.1	14.32	3.751	12.8	0.2322	13.42	17.73	8.964	5.066	3.466	32	1.651e+06	7816

Correlation



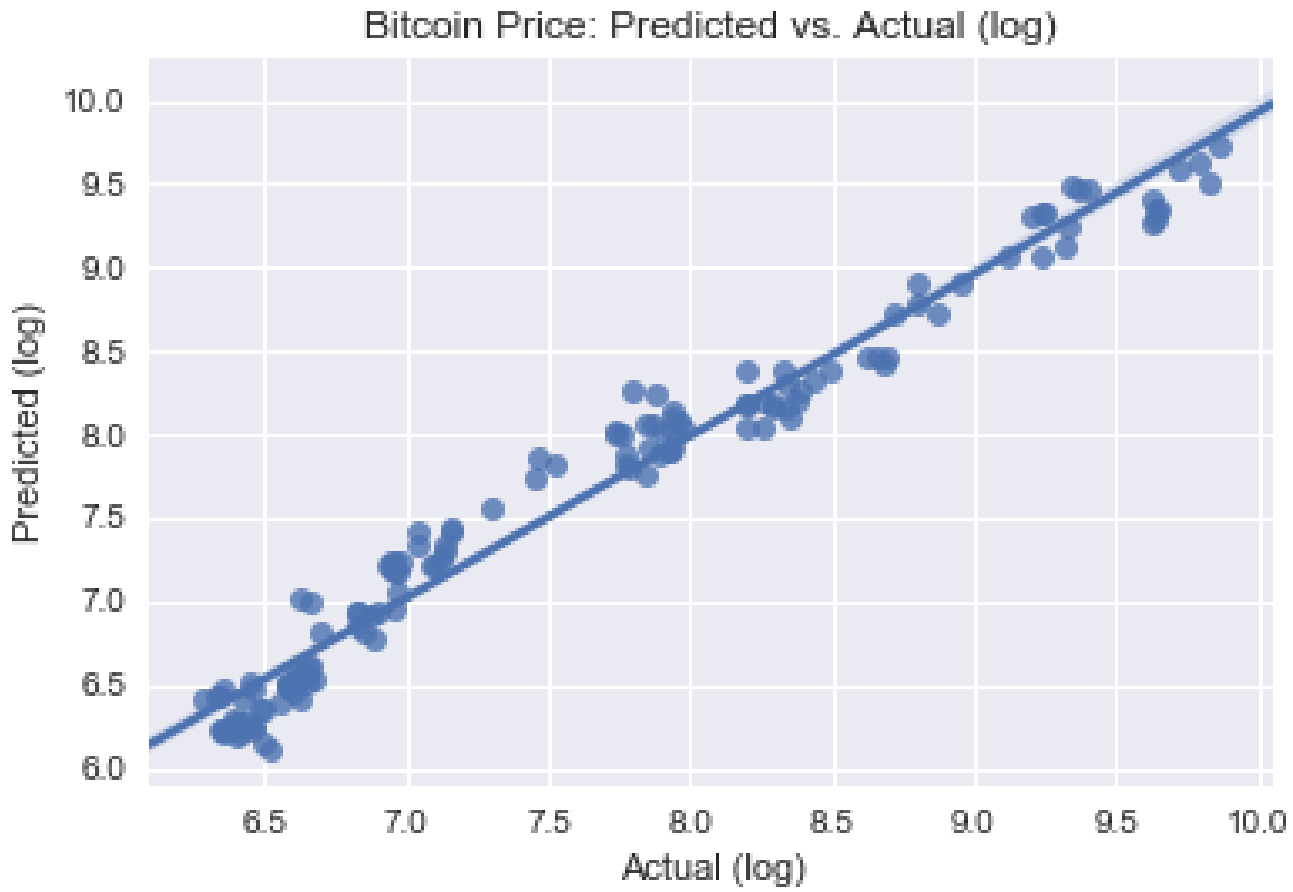
Features contribute

We found the 3 core features for the model

- Nasdaq
- Interest
- TxFees

Index	ogBTCPric	ogNasdac	ogInteres	logTxFees
2021-06-01 00:00:00	8.907	8.964	3.829	14.32
2021-06-08 00:00:00	8.907	8.964	3.829	14.32
2021-06-15 00:00:00	8.907	8.964	3.829	14.32
2021-06-22 00:00:00	8.907	8.964	3.829	14.32
2021-06-29 00:00:00	8.907	8.964	3.829	14.32
2021-07-01 00:00:00	8.907	8.964	3.466	14.32
2021-07-06 00:00:00	8.907	8.964	3.466	14.32
2021-07-13 00:00:00	8.907	8.964	3.466	14.32
2021-07-20 00:00:00	8.907	8.964	3.466	14.32
2021-07-27 00:00:00	8.907	8.964	3.466	14.32
2021-08-01 00:00:00	8.907	8.964	3.466	14.32
2021-08-03 00:00:00	8.907	8.964	3.466	14.32
2021-08-10 00:00:00	8.907	8.964	3.466	14.32
2021-08-17 00:00:00	8.907	8.964	3.466	14.32
2021-08-24 00:00:00	8.907	8.964	3.466	14.32
2021-08-31 00:00:00	8.907	8.964	3.466	14.32
2021-09-01 00:00:00	8.907	8.964	3.401	14.32

Linear Regression



3-LR Analysis

OLS Regression Results

Dep. Variable:	logBTCPrice	R-squared:	0.846
Model:	OLS	Adj. R-squared:	0.845
Method:	Least Squares	F-statistic:	1093.
Date:	Fri, 22 Oct 2021	Prob (F-statistic):	9.14e-242
Time:	09:56:06	Log-Likelihood:	-86.459
No. Observations:	600	AIC:	180.9
Df Residuals:	596	BIC:	198.5
Df Model:	3		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	-28.6365	1.013	-28.280	0.000	-30.625	-26.648
logInterest	0.5346	0.025	21.446	0.000	0.486	0.584
logNasdaq	3.9967	0.115	34.680	0.000	3.770	4.223
logTxFees	0.0146	0.014	1.075	0.283	-0.012	0.041

Omnibus:	8.798	Durbin-Watson:	0.080
Prob(Omnibus):	0.012	Jarque-Bera (JB):	8.779
Skew:	-0.269	Prob(JB):	0.0124
Kurtosis:	3.247	Cond. No.	1.46e+03

Result

Train accuracy

- 0.8399367307539943

Test accuracy = accuracy for the model

- 0. 8568224150791021

Regularization

Train accuracy

- 0.8397597320509806

Test accuracy = accuracy for the model

- 0.8568917069026165

Future work

- Further explore seasonality in residual data
- Explore social media sentiment (e.g. Twitter) as leading indicator

Other analyses to explore

- ✓ Usage by country
- ✓ Bitcoin trading by exchange
- ✓ Bitcoin trading by currency
- ✓ SEASONALITY
- ✓ Time series

Thank you, any question ?

Tools

- pandas
- numpy
- requests
- bs4 (BeautifulSoup)
- dateutil(parser)
- pprint
- json
- Datetime
- Seaborn
- matplotlib
- Statsmodels
- patsy
- sklearn
- warnings